

Notice of Allowability

Application No.

10/079,414

Examiner

John S. Chu

Applicant(s)

KODAMA ET AL.

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/29/04.
2. ☒ The allowed claim(s) is/are 1-19.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance: The claimed invention is drawn to the following:

1. A positive photosensitive composition comprising:
 - (A) an acid generator capable of generating an acid upon irradiation with one of an actinic ray and a radiation;
 - (B) a resin: having a monocyclic or polycyclic alicyclic hydrocarbon structure; and being capable of decomposing by the action of an acid to increase the solubility in an alkali developer;
 - (C) a basic compound; and
 - (D) a surfactant containing at least one of a fluorine atom and a silicon atom;wherein the acid generator (A) comprises at least two compounds selected from the group consisting of a sulfonium salt compound not having an aromatic ring, a triarylsulfonium salt compound, and a compound having a phenacylsulfonium salt structure.

The invention step in claim 1 is the particular combination of the ingredients wherein the acid generator comprises at least two compounds selected from the group consisting of a sulfonium salts not having an aromatic group, a triarylsulfonium salt and a compound having a phenacylsulfonium salt compound and these two acid generators are in a mixture with a basic compound and a fluorine and silicon containing surfactant along with a resin as recited above. The rejection over HARADA et al has been overcome by the certified English translation which perfect the priority of the current application based on their priority documents thus predating the filing date of HARADA et al.

The following references disclose chemically amplified resist compositions suggesting the use of a basic compound as an acid quencher and a surfactant:

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EP 1,041,442 disclose that surfactants can be used, however lack the specific disclosure to a claimed fluorine and silicon containing surfactants in the prior art references.

Each of KODAMA et al (6,699,635), AOAI et al (6,787,283), SATO et al (6,596,458) and KAWABE et al (6,159,656) disclose chemically amplified composition comprising a resin having a monocyclic or polycyclic ring decomposable by an acid, a single sulfonium acid generating compound, a basic compound and a surfactant containing fluorine and silicon atoms. The references fail to suggest or teach the claimed use of at least two of the specified sulfonium salts as claimed.

FUJI MORI et al (6,630,280) discloses the use of two sulfonium salts in a composition with an acid cleavable resin having monocyclic or polycyclic rings, a basic compound and a surfactant having a fluorine atom and a silicon atom. The both sulfonium salts were bonded to aromatic rings and failed to disclose a sulfonium salt without an aromatic ring or a phenacylsulfonium salt.

The examiner in addition has considered the comparative data in the specification at Tables 10, 14 and 17 wherein the comparative examples demonstrate that compositions which fail to use the specified combination of ingredients as claimed gave inferior results with respect to defocus latitude, side lobe margin and formation of particles. These comparative examples used a single sulfonium salt in the composition, lacked the presence of a basic compound, lacked the presence of the fluorine and silicon containing surfactant or lacked the specific two sulfonium salts as claimed and gave inferior results as seen in Tables 21, 25, and 28.

Based on the comparative evidence of record any rejection under 35 U.S.C. 103 for obviousness suggesting the particularly claimed invention would be overcome based on this

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evidence and the Office relies on this evidence, which would rebut any obviousness rejection.

Further none of the prior art references anticipate the claimed composition by explicit disclosure such as by example.

Claims 11-19 were previously withdrawn from consideration as drawn to a separate species of composition. Because claims 1-10 were determined to be allowable over the prior art, these claims are now considered and examiner.

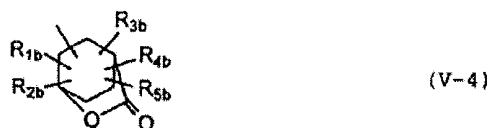
The claimed invention is drawn to the following:

11. A positive photosensitive composition comprising:

- (A) a compound capable of generating an acid upon irradiation with one of an actinic ray and a radiation; and
- (B1) a resin capable of increasing the solubility in an alkali developer by the action of an acid, in which the resin

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has: a repeating unit having a group represented by formula (V-1), (V-2), (V-3) or (V-4) below; and an aliphatic cyclic hydrocarbon group:



wherein R_{1b} , R_{2b} , R_{3b} , R_{4b} and R_{5b} each independently represents a hydrogen atom, an alkyl group which may have a substituent, a cycloalkyl group which may have a substituent, or an alkenyl group which may have a substituent; two of R_{1b} , R_{2b} , R_{3b} , R_{4b} and R_{5b} may be bonded to form a ring,

wherein the acid generator (A) comprises at least two compounds selected from the group consisting of a triarylsulfonium salt compound, a compound having a phenacylsulfonium salt structure, and a sulfonium salt compound not having an aromatic ring.

The inventive step is the combination of the repeating units mentioned above and an aliphatic cyclic hydrocarbon in a resin wherein the resin is capable of increasing the solubility in

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an alkali developer by the action of an acid which is in a composition with an acid generating compound comprising at least two compounds selected from the group consisting of the aforementioned sulfonium salts.

The closest prior art reference of record is to FUJIMORI et al (6,692,884) which discloses a resin having the repeating units (V-1 – (V-4) and an aliphatic cyclic hydrocarbon, however the reference discloses the use of a sulfonate compound of a sulfonium salt and a sulfonate compound of a N-hydroxyimide or diazomethane. This reference lack the claimed at least two sulfonium salts as recited.

Because the use of more than one photoacid generating compound in a chemically amplified resist is known and the Markush listing of the sulfonium salts in claim 11 are known in the art, a *prima facie* case of obviousness could be made over FUJIMORI et al '884 in view another reference, however because applicants have provided comparative evidence in the specification which demonstrate the improved properties in PED stability, Sensitivity Fluctuation, PED Fluctuation with Aging, Half Tone Aptitude (side lobe resistance), Hole Pitch Dependency, Exposure Margin, and Film Decrease Uniformity any rejection under 35 U.S.C. 103 would be overcome.

Further because none of the references of record anticipate the claimed invention, claims 11-19 are seen as allowable and passed to issue along with claims 1-10 above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

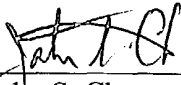
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2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

The fax phone number for the USPTO is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John S. Chu
Primary Examiner, Group 1700

J.Chu
September 13, 2004